Petrological Abstracts and Reviews

Edited by ALBERT JOHANNSEN

Arschinow, Wladimir. "Ueber die Verwendung einer Glashalbkugel zu quantitativen optischen Untersuchungen am Polarisationsmikroskope," *Zeitschr. Kryst.*, XLVIII (1910), 225–29. Fig. 1.

A simple apparatus for making quantitative measurements by tilting a thin section under the microscope. The author claims to be able to make measurements with as great a degree of accuracy as may be made with Fedorow's or Klein's Universaltisch.

The instrument consists of a glass hemisphere, 50–60 mm. in diameter, which is centered upon the stage of the microscope and rotated by hand. The section is fastened to the flat side of the hemisphere with cedar oil or glycerin, and with the cover-glass down. The determination of planes of extinction and so on are made as with the Fedorow Universaltisch, and the angle of rotation is measured by means of two graduated metal strips, attached 90° apart, to a movable ring around the equator of the glass hemisphere, and themselves capable of being moved on pivots. By raising the tube of the microscope above these rings, the angles at which they cross may be read, and this determines the amount of rotation of the glass hemisphere. For certain measurements a small glass hemisphere, 8–15 mm. in diameter, is attached to the upper surface of the slide.

Albert Johannsen

Bastin, Edson S. "Geology of the Pegmatites and Associated Rocks of Maine," *Bull. U.S. Geol. Survey No. 445*, Washington, 1911. Pp. 152, pl. 18, figs. 8, map 1.

In this bulletin on the pegmatites of Maine, Doctor Bastin has given not only local descriptions but has made an important contribution to the general literature of the pegmatites as well. The work is divided, practically, into three parts: a general discussion of pegmatites

and in particular those of Maine, local descriptions by counties, and descriptions of the economically important minerals.

Granite-pegmatites are defined here as differing but little from the granites of the state in mineral composition, but are characterized, not necessarily by coarse, but by extreme irregularity of grain. They occur in dikes or sill-like masses, generally of sheet-like form and sometimes of considerable size. The contact with the country rock is generally sharp, indicating very little assimilation by the pegmatite even where it is of batholithic dimensions. Contact metamorphism around the pegmatites is no greater than that near granite contacts, and indicates, according to the writer, that the amount of mineralizers present was but little greater than in the latter rocks; less than ten times as great, probably. Genetically the pegmatites are related to the associated granites and are probably contemporaneous with them. Where particularly abundant, they form, apparently, the roofs above granite batholiths. An examination of the quartz grains indicates, in the coarser varieties, that the crystallization began slightly above 575° C. and ended at a lower temperature. The finer-grained varieties may have crystallized entirely above 575°.

Among the minerals of economic importance found in the Maine pegmatites are the feldspars, orthoclase and microcline rose and smoky quartz, amethyst, muscovite, tourmaline, beryl of various colors, and topaz. The occurrences, compositions, properties, and uses of these minerals are discussed.

ALBERT JOHANNSEN

COUYAT, J. "Les roches sodiques du désert arabique," *Comptes Rendus de l'Académie des Sciences*, CLI (1910), 1138–41.

In a region east of the Nile, near longitude 34° 18′ E., latitude 24° 40′ N., there are dikes and stocks of nepheline syenite with much variation in texture, also tinguaite and sölvsbergite. Four analyses of the syenite show SiO_2 60.1 to 56.5 per cent; Na_2O 9.0 to 10.6 per cent; K_2O 4.5 to 5.2 per cent; Fe_2O_3, FeO 3.2 to 6.1 per cent; very low MgO and CaO. In the quantitative classification the rocks are miaskoses and laurdaloses.

The syenites are related to volcanic eruptives of Cretaceous age and posterior to a series of trachytes, andesites, and basalts.

F. C. CALKINS

DUPARC, L., AND PAMPHIL, G. "Sur l'issite, une nouvelle roche filonienne dans la dunite," *Comptes Rendus de l'Académie des Sciences*, CLI (1910), 1136–38.

The rocks described form dikes in massive dunites of the platinum deposits in the basin of the river Iss. They consist mainly of hornblende, with subordinate pyroxene, labradorite in some cases, magnetite, and apatite. Five analyses are given. SiO_2 ranges approximately from 33 to 47 per cent; Fe_2O_3 from 3 to 9 per cent; FeO from 14 to 9 per cent; CaO from 16 to 11 per cent; MgO from 10 to 7 per cent; total alkalies 2 to 3 per cent. In the quantitative classification, the rocks fall in auvergnose and three unnamed subrangs.

F. C. CALKINS

DUPARC, L., AND WUNDER, M. "Sur les Serpentines du Krebet-Salatim (Oural du Nord)," *Comptes Rendus de l'Académie des Sciences*, CLII (1911), 883–85.

Describes dunites and harzburgites more or less completely altered to antigorite and bastite. Five analyses of these rocks and one of the inclosed calcareous hornfels are given.

F. C. CALKINS

GRANDJEAN, F. "Sur un mesure du laminage des sédiments (calcaires et schistes) par celui de leurs cristaux clastiques de tourmaline," *Comptes Rendus de l'Académie des Sciences*, CLI (1910), 907–9.

The author finds tourmaline an unfailing constituent of shales and limestones. The crystals of this mineral in deformed rocks show a middle portion normal in color and apparently undeformed, and ragged terminal portions of paler hue. The terminal zones are considered due to elongation of the tourmaline, and their average length (about 30 measurements is ordinarily sufficient) gives a co-efficient of deformation for the rock.

F. C. CALKINS

GROTH-JACKSON. *The Optical Properties of Crystals*. New York: John Wiley & Sons, 1910. Pp. xiv+309, figs. 121, colored plates 2.

In spite of a number of good books on optical crystallography which have appeared within the past few years, no work has quite taken the

place of Groth's classical *Physikalische Krystallographie*, and it is with great pleasure that this translation of certain parts is welcomed. The only criticism that can be made is that Professor Jackson did not translate the entire work.

The translation, in general, follows the form of the original and includes all of the "Optical Properties" in Part I, with additions, here and there, from the parts in the original devoted to systematic descriptions of crystals and methods of crystal investigation. The translation seems to be good, although, in places, the sentences, closely following the German, are rather long. A slight error is introduced, on p. 15, where the number of vibrations per second of red and violet light are spoken of, by the translation of the German billion (10^{12}) as billion (10^{9}).

The book is well gotten up, and the line drawings, apparently from wax plates, are sharp and clear.

ALBERT JOHANNSEN

HOWE, J. ALLEN. *The Geology of Building Stones.* New York: Longmans, Green & Co.; London: Edward Arnold, 1910. 12mo, pp. viii+455, pl. 8, maps 7, figs. 31.

This work, the fourth of Arnold's Geological Series, under the general editorship of Dr. J. E. Marr, apparently is intended primarily for architects. It treats of the rock-forming minerals and the rocks in non-technical language and gives the principal properties of each. The decay of building stone is discussed, and methods of testing are described. The author says, "There is no help: sooner or later, in the course of practice, the architect or engineer will have the need of some geological knowledge forced upon him." If the little knowledge is not a dangerous thing, this book may serve a useful purpose.

ALBERT JOHANNSEN

LACROIX, A. "Le cortège filonien des péridotites de la Nouvelle Calédonie," *Comptes Rendus de l'Académie des Sciences*, CLII (1911), 816–22.

The peridotites of Nouvelle Calédonie are cut by narrow dikes forming a gabbroic and a dioritic series. In both, gradations can be traced between a leucocratic extreme (anorthosite) and a melanocratic extreme, (pyroxenite or hornblendite). Nine analyses are given which prove that six of the rocks fall into previously unnamed subdivisions of the

quantitative classification. These are: Ouenose (III. 5. 5. 4–5); Caledonose (I. 5. 5. 4–5); Thiose (IV. 1[2]. 1[2]. 2); Naketose (IV. 2[3]. 1[3]. 2); Koghose (III. 4. 4. 4–5).

In the gabbroic series, SiO_2, Al_2O_3, and CaO increase together, while FeO and MgO decrease. Because of the basicity of the feldspars the most feldspathic phase is the poorest in SiO_2. In the dioritic series, the proportion of lime is nearly constant, silica varies irregularly, Al_2O_3 and alkalies increase with the feldspar content.

There are also dikes composed almost wholly of magnesiochromite; these locally contain chrome-bearing diopside and bronzite, and are associated with anorthosites.

F. C. CALKINS

LEISS, C. "Neues Mikroskop Modell VI*b* für krystallographische und petrographische Studien," *Zeitschr. Kryst.*, XLVIII (1910), 240–42. Fig. 1.

A large microscope similar in construction to the Hirschwald microscope (Fuess VI*a*). It differs, however, in having an Abbe condenser and Ahrens polarizer, and a large, flat micrometer stage. Like the VI*a* microscope, the upper and lower nicols can be rotated simultaneously. This does away with the cap nicol and permits the use of a large tube, giving an extra large field.

ALBERT JOHANNSEN

SKEATS, ERNEST W. "The Volcanic Rocks of Victoria," *Australian Association for the Advancement of Science*, 1909, 173–235. Pl. 4, numerous analyses.

This paper was read as the Presidential Address, Section C, of the Australian Association for the Advancement of Science. It contains a summary of the present knowledge of the Victorian volcanic rocks and has appended a bibliography of 268 items, dealing wholly, or in part, with these rocks. The geographical distribution is shown on a map and the geological range was determined to be from Basal Ordovician (?) to recent. Petrographically the rocks are rhyolites, dacites, basalts, quartz porphyries, granite porphyries, diabases, serpentines, quartz keratophyres, melaphyres, sölvsbergites, limburgites, and the new rocks anorthoclase trachyte, anorthoclase-olivine trachyte, olivine-anorthoclase basalt, olivine-anorthoclase andesite, and macedonite. Petrographical descriptions, not as complete as might be desired, espe-

cially those dealing with new types, are given, and the geographical and geological relations are shown. The new rock terms proposed are:

Anorthoclase trachyte.—This type was previously described by Professor Gregory as trachyphonolite. As described by Skeats, in a corrected copy of his paper, it is "a dark-greenish rock. Large phenocrysts of anorthoclase are numerous. The ground mass has sometimes a fluidal arrangement of laths of anorthoclase, in other cases the crystals are stouter and the structure orthophyric. Small crystals of aegirine are scattered through the rock, a little green glass, a few sections of nosean, ilmenite, and occasionally apatite are also present." From the description it does not appear that any other feldspar occurs, although the statement, in another place, that "anorthoclase is the dominant felspar," suggests that another is present.

Anorthoclase-olivine trachyte.—Spoken of as "more basic than the rock just described." It resembles the former rock but contains, in addition, more or less olivine.

Olivine-anorthoclase basalt.—"A still less acid type. . . . . It differs mainly from the last type in the greater abundance of olivine and less frequent anorthoclase." In the opinion of the reviewer this description would hardly justify the use of the term basalt.

Macedonite is a non-porphyritic, basaltic-looking rock and in the annotated copy is said to "consist largely of minute felspars, a colourless to green interstitial mineral, either glass or chlorite, serpentine or chlorite pseudomorphs after olivine, some light-brown biotite and purplish, fibrous apatite prisms. Octahedra of perofskite occur, some of which are opaque, others of a dark grayish-green colour. The exact relations of this rock are difficult to determine. Chemically it is in some respects intermediate between the tephrites and the orthoclase basalts, but mineralogically it is quite distinct. Its nearest relations are with the mugearites, from which it differs in the ratio of soda to potash and in the small amount of olivine present." The writer does not say what kind of feldspar is present, but if the analysis is computed in the Quantitative System of C.I.P.W., the norm shows orthoclase, 20.02 per cent, albite, 29.87 per cent, and anorthite, 18.63 per cent. As computed by the reviewer the rock is a Shoshonose.

Olivine-anorthoclase andesite.—This is a porphyritic, subsiliceous andesite. It contains lath-shaped plagioclase and granular or ophitic augite, magnetite, and olivine as its normal constituents. Corroded phenocrysts of anorthoclase occur and connect this type with the alkali rocks.

While exact and detailed descriptions may seem tedious in an address, it would be desirable in printed descriptions of new types of rocks that they be made as complete as possible and that the relative amounts of the different constituents be stated. For such rocks, clear-cut definitions should be given.

The paper is a well-written summary of what is known of the volcanic rocks of Victoria, and one is always thankful for contributions containing careful analyses and complete bibliographies.

ALBERT JOHANNSEN

WATSON, THOMAS L. "Intermediate (Quartz Monzonitic) Character of the Central and Southern Appalachian Granites," *Bull. Phil. Soc., Univ. Va.*, I (1910), 1–39.

By comparing the analyses of granites from different parts of the Appalachian region, the author finds that they are, in general, of monzonitic character, the soda being molecularly equal to or greater than potash. Comparing the western granites with the Appalachian rocks, he finds that "the eastern type shows stronger granite affinities and the western type stronger quartz diorite affinities." In general the granites of the eastern region are of similar composition, containing acid oligoclase and some albite in addition to potash feldspar; the ratio averaging 1.88 to 1. All of the granites, from Alabama to New England, as well as the subsilicic gabbros, diabases, pyroxenites, and peridotites, "have been derived from a common parent body of magma intruded, in most cases, at different times," says the writer. The age of the massive granite is stated to be early or later Paleozoic, while the granite-gneisses (gneissoid-granites) are pre-Cambrian.

Numerous analyses, all of them partial, are given.

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